CLAIMS

1. An electron beam irradiation apparatus comprising:

a rotary driving unit for rotationally driving a disc-shaped object;

a shield container for rotatably accommodating the disc-shaped object; and

an electron beam irradiation unit provided in said shield container so that a face to be irradiated on the surface of the disc-shaped object is irradiated with electron beams,

characterized in that when the face to be irradiated is irradiated with the electron beams emitted from said electron beam irradiation unit during rotations of the disc-shaped object, an irradiation beam intensity of the electron beams is set larger on the side of an outer peripheral surface in a radial direction of the disc-shaped object than on the side of an inner peripheral surface.

2. An electron beam irradiation apparatus according to claim 1, wherein an acceleration voltage of said electron beam irradiation unit is 20 kV through 100 kV.

3. An electron beam irradiation apparatus according to claim 1 or 2, wherein said electron beam irradiation unit includes a plurality of electron beam irradiation tubes arranged in the radial direction.

4. An electron beam irradiation apparatus according to

claim 3, wherein each of current values of said plurality of electron beam irradiation tubes is set so that the current value of said electron beam irradiation tube disposed on the side of the outer peripheral surface is larger than the current value of said electron beam irradiation tube disposed on the side of the inner peripheral surface.

5. An electron beam irradiation apparatus according to claim 3 or 4, wherein said plurality of electron beam irradiation tubes respectively have irradiation windows through which the electron beams are irradiated toward the outside, and are arranged so that a distance from the face to be irradiated to said irradiation window is shorter in said electron beam irradiation tube on the side of the outer peripheral surface than a distance in said electron beam irradiation tube on the side of the inner peripheral surface.

6. An electron beam irradiation apparatus according to any one of claims 3 through 5, wherein at least one of said plurality of electron beam irradiation tubes is disposed so that said irradiation window thereof is inclined close to the side of the outer peripheral surface of the face to be irradiated.

7. An electron beam irradiation apparatus according to any one of claims 3 through 6, wherein said plurality of electron beam irradiation tubes are arranged substantially in the same

direction along the radial direction.

8. An electron beam irradiation apparatus according to any one of claims 3 through 6, wherein said plurality of electron beam irradiation tubes are arranged in different directions in the radial direction.

9. An electron beam irradiation apparatus according to claim 1 or 2, wherein said electron beam irradiation unit includes an electron beam irradiation tube having an irradiation window through which the electron beams are irradiated to the outside, and

said electron beam irradiation tube is disposed so that said irradiation window thereof is inclined close to the side of the outer peripheral surface of the face to be irradiated.

10. An electron beam irradiation apparatus according to any one of claims 1 through 9, wherein an interior of said shield container is set in an atmosphere of an inert gas, and

said shield container is provided with a gas introduction port and a gas discharge port through which the inert gas flows in the vicinity said irradiation window.

11. An electron beam irradiation apparatus according to claim 10, wherein a temperature sensor is provided in the vicinity of said electron beam irradiation unit, and

a flow rate of the inert gas is adjusted based on a

temperature measured by said temperature sensor.

12. An electron beam irradiation apparatus according to any one of claims 1 through 11, wherein an oxygen concentration meter for measuring an oxygen concentration within said shield container, is provided.

13. An electron beam irradiation apparatus according to any one of claims 1 through 12, wherein a vacuumizing device for depressurizing the interior of said shield container is provided.

14. An electron beam irradiation apparatus according to any one of claims 1 through 13, wherein said shield container is openable/closable and composed of a metallic material, and has a shield structure for shielding the electron beams emitted from said irradiation window.

15. An electron beam irradiation apparatus according to any one of claims 1 through 14, further comprising: a shutter member disposed between said electron beam irradiation unit and the irradiated surface, and movable between an opening position for opening to permit transmission of the electron beams and a closing position for closing to block the electron beams; and

a shutter driving mechanism for moving said shutter member so as to effect switchover to the irradiation and non-

irradiation of the electron beams during rotations of said disc-shaped object.

16. An electron beam irradiation apparatus according to claim 15, wherein said shutter member is constructed to open and close at a higher speed than a peripheral speed on the outer periphery of said disc-shaped object.

17. An electron beam irradiation method characterized by comprising:

a step of rotationally driving a disc-shaped object; and a step of irradiating a face to be irradiated of the on-rotating disc-shaped object with the electron beams emitted from an electron beam irradiation unit so that an irradiation beam intensity of the electron beams is set larger on the side of an outer peripheral surface in a radial direction of the disc-shaped object than on the side of an inner peripheral surface.

18. An electron beam irradiation method according to claim 17, wherein an acceleration voltage of said electron beam irradiation unit is 20 kV through 100 kV.

19. An electron beam irradiation method according to claim 17 or 18, wherein each of current values of a plurality of electron beam irradiation tubes arranged in the radial direction serving as said electron beam irradiation is set

that the current value of said electron beam irradiation tube disposed on the side of the outer peripheral surface is larger than the current value of said electron beam irradiation tube disposed on the side of the inner peripheral surface.

20. An electron beam irradiation method according to any one of claims 17 through 19, wherein a distance from the irradiated surface to each of said electron beam irradiation windows of said plurality of electron beam irradiation tubes arranged in the radial direction serving as said electron beam irradiation unit is set so that the distance in said electron beam irradiation tube on the side of the outer peripheral surface is shorter than the distance in said electron beam irradiation tube on the side of the inner peripheral surface.

21. An electron beam irradiation method according to claim 19 or 20, wherein at least one of said plurality of electron beam irradiation tubes is inclined so that said irradiation window thereof gets close to the side of the outer peripheral surface of the face to be irradiated.

22. An electron beam irradiation method according to claim 17 or 18, wherein said electron beam irradiation tube arranged as said electron beam irradiation unit is inclined so that said irradiation windows thereof get close to the side of the outer peripheral surface of the irradiated surface.

23. An electron beam irradiation method according to any one claims 17 through 22, wherein an air-tightly closable shield container rotatably accommodates said disc-shaped object, and

an interior of said shield container is replaced with an inert gas atmosphere by introducing an inert gas into the interior of said shield container.

24. An electron beam irradiation method according claim 23, wherein the inert gas is flowed through the vicinity of said irradiation window of said electron beam irradiation unit toward a gas discharge port from a gas introduction port, thereby cooling off said irradiation window.

25. An apparatus for manufacturing a disc-shaped object, comprising an electron beam irradiation apparatus according to any one of claims 1 through 16,

characterized in that a resin layer and/or a surface layer formed on said disc-shaped object is cured by the irradiation of the electron beams.

26. A method of manufacturing a disc-shaped object, involving the use of an electron beam irradiation apparatus according to any one of claims 1 through 16, or an electron beam irradiation method according to any one of claims 17 through 24,

characterized in that a resin layer and/or a surface layer

formed on said disc-shaped object is cured by the irradiation of the electron beams.